

Zero Retries issue 0073 2022-11-18

Zero Retries is an independent email newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience. It's free (as in beer) to subscribe.

About Zero Retries

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Request To Send

I've applied for an account on Mastodon - n8gnj@mastodon.radio; my application is ~~pending as I write this~~ [approved](#). As with most folks trying out the Mastodon social network of late, my trying out Mastodon is a reaction to the chaos occurring at Twitter under new ownership / management. At first I thought the *Twitterpocalypse* was overblown. Because I curated my Twitter experience for Zero Retries tightly, initially there wasn't any noticeable difference under the new ownership of Twitter... until there *was*. Every week since the ownership change, there have been fewer and fewer tweets that are Zero Retries Interesting tweets. Twitter accounts that I followed and were highly useful have stopped posting, and many of those have simply left Twitter. At this point, it seems quite possible that Twitter's utility to Zero Retries will dwindle to "not that useful", thus it's time to consider other options. I'll remain on Twitter as long as it continues to be more useful than not.

I have no opinions yet on the utility of Mastodon. One potential downside versus Twitter is that the mastodon.radio server that I've requested an account on is intended for use by Amateur Radio Operators. The downside of that focus on Amateur Radio is that on Twitter, I was able to follow folks that were posting Zero Retries Interesting items that had not much to do with Amateur Radio, but were useful and interesting to discuss in Zero Retries. I'm not sure how easy / efficient / possible it will be to replicate that on Mastodon.

It's worth noting that there *are* long-established communities of thought specifically for Amateur Radio. Despite the annoying and spammy blinky advertising, [QRZ](#) features news and forums, as does [eHam](#). Unfortunately, I just didn't see very much that was Zero Retries Interesting on either QRZ or eHam¹. I'm sure there are Discord servers for Amateur Radio... oops, [maybe not](#). Not to mention that the various YouTube channels and mailing lists on groups.io and Google Groups on Amateur Radio topics often serve as defacto communities of thought.

So... regarding Mastodon... we'll see.

de Steve N8GNJ

Thought Experiment - Amateur Radio Social Network - *On Amateur Radio*

To complete this article by deadline (I'm a bit behind this week) I won't discuss some successful and active Amateur Radio Networks on Amateur Radio such as [HAMNET](#), [HamWAN](#), and [AREDN](#) that are largely based on microwave linking. Not to mention the network that has grown up around the [QO-100](#) geosynchronous payload that's accessible to most Amateur Radio Operators in the Eastern hemisphere. Those networks certainly deserve inclusion in the discussion below - at some future time, including the curious issue that while these high-speed networks can accommodate social networking software and systems such as Mastodon... very few actually do so.

As I was thinking about social networking for Amateur Radio Operators... my thoughts started turning towards (re)building a "social network" on Amateur Radio. This might get a bit hard to follow for those that weren't deeply immersed in Amateur Packet Radio back in the 1980s, so allow me to do some explanations of the way it was.

Before there was public access to the Internet (access was restricted to universities, industries involved in government contracting, and US government), there were various networking systems; kind of proto Internets. Examples were [Compuserve](#), [FidoNet](#), [Bulletin Board Systems \(BBS\)](#), and Amateur Radio Packet Radio networks, including [Packet Radio Bulletin Board Systems \(PBBS\)](#). There was also [Usenet](#) which was kind of Internet, kind of not Internet, that wasn't subject to the restrictions on direct access to the Internet.

Of course, once "civilians" were able to get access to the Internet, all of the above dwindled drastically - the Internet was just *so* much better.

Amateur Radio Packet Radio, and PBBS *worked* as a social network for Amateur Radio, and it all worked *on* Amateur Radio. As an Amateur Radio Operator, you connected via Amateur Radio VHF or UHF to your local PBBS, and you downloaded any individual messages (email) and then read bulletins, either local or from other parts of the country (or world) and downloaded any new files in the file library.

There were so many problems with the way we used to do Packet Radio networking and using PBBS...

- It was slow. 1200 bits per second data transfer, and if the channel was busy, there were collisions with other users transmitting, requiring retransmissions, etc.
- Packet Radio networking was only somewhat effective as it was based on TNCs with a 1 MHz processor, 32 kB for firmware, and 32 kB for Random Access Memory (RAM).
- For each user to have a file or bulletin, it had to be retransmitted individually; not very efficient on "channel time".
- The majority of the VHF and UHF bands were used for FM repeater voice communications. Packet Radio had to be "shoehorned" into the FM repeater paradigm.
- TNCs and computers were expensive. By comparison to today, software was primitive and trouble-prone running on single-tasking operating systems like PC-DOS.

Of course, it's very different *now*.

- We have radios that can do data much faster such as the [Yaesu FTM-6000R](#) which includes a "flat audio" connection for fast data. We even have entirely new families of data radios for Amateur Radio such as [New Packet Radio](#) and [RPX-100](#).
- We have new data modes such as VARA FM and even Packet Radio reimaged for embedded computers and using a high performance audio interface. The [NinoTNC](#) and [Dire Wolf](#) software can do up to 9600 bps and can also enable Forward Error Correction (FEC). Not only can we do faster over-the-air speeds, but we can do it more reliably using FEC.
- To do networking, we now have inexpensive embedded computers such as the Raspberry Pi with processors operating at speeds > 1 GHz, essentially unlimited storage (SD cards) and up to 8 GB of RAM. That amazing compute power enables a much more powerful operating system - Linux, instead of firmware embedded in a Read Only Memory (ROM) chip.
- TCP/IP was an exotic mode compared to Packet Radio. Now, it's mainstream and built-in to Linux. TCP/IP over Packet Radio "just works".
- Wide area networking was generally done with digipeaters on a single frequency. A packet was received by the digipeater, and then retransmitted on the same frequency. Under ideal conditions / usage, that cut the potential capacity of the wide-area channel by 50%.
- That cheap, abundant compute power has moved data modes into the realm of software such as Dire Wolf, needing only a [reasonable audio interface](#). It's also enabled much more sophisticated PBBS capabilities.
- Usage of Amateur Radio VHF / UHF bands has fallen dramatically, thus using channels for data is much more feasible than it used to be.

In fairness to their vision (for nearly a decade now), and to give credit where due, the “it’s different *now*” perspective is most of the premise of [Terrestrial Amateur Packet Radio Network \(TAPRN\)](#).

TAPRN **Terrestrial Amateur Radio Packet Network**

An ever expanding group of Amateur Radio operators are working together to use many VHF/UHF radios to link multiple ham radio stations in a digital network for the purpose of having fun in a fun, educational, hobbyist-controlled environment, built using ham radio infrastructure based on packet radio technology. No Internet traffic is required or even desired! Goals [include]

- Linked entirely over hobbyist-controlled radio equipment;
- To establish camaraderie;
- Inspire the curious;
- Attract and retain new hams including younger hams.

The software suite that TAPRN has developed incorporates Packet Radio Bulletin Board Systems and realtime chatting. There are elements of the TAPRN vision that I quibble with such as a strong preference that to join a TAPRN network requires building your own NinoTNC, no use of repeaters, and insistence on dedicated channels for radio links, but generally I support what TAPRN is trying to do. A TAPRN network is a social network for Amateur Radio that *operates on Amateur Radio*.

In addition to what TAPRN has chosen to do, Amateur Radio has some really amazing technology and capabilities that we can incorporate into a vision of an Amateur Radio social network.

- Amateur Radio has other bands to make use of including “6 meters on 50-54 MHz and “1.25 meters” on 222-225 MHz.
- We have very inexpensive software defined receivers that can now receive all of the Amateur Radio VHF and UHF bands. With that kind of receive capability, we can build Packet Radio Networks that are very different from the single-frequency for transmit and receive. For example, what if a PBBS listened on 2 meters (144-148 MHz) and transmitted on 6 meters (50-54 MHz). 6 meter transceivers are rare now, but 50-54 MHz is easily within the range of an inexpensive software defined receiver, so nearly anyone could receive transmissions from the BBS.
- What if instead of each individual user downloading the same bulletin, we just “flood” bulletins to all users simultaneously using a broadcast-and-fill protocol such as RadioMirror or flamp?
- What if we used “unused repeater time” in the wee hours to synchronize all BBS systems in an area with the same files, the same bulletins, exchange inter-BBS email, etc.

The primary point of this thought experiment is that we have many, and very good, very capable tools to reimagine social networking for Amateur Radio Operators over Amateur Radio. Let’s start doing so!

We Use Baofeng's “Heart” For Our Projects

Andreas Speiss HB9BLA

Most of us own a Baofeng. It is cheap and does the job. What would you say if we could transplant its “heart” and combine it with a Raspberry Pi or an ESP32? We would get a dirt cheap and compact device for all sorts of analog and digital modes.

Testing New AREDN Software

Orv Beach W6BI, AREDN Ambassador, on the [AREDN Forum](#):

The AREDN devs are working on the software updates needed to support a new generation of hardware. That hardware, in addition to supporting the 802.11n protocol that the AREDN software currently uses, also now supports 802.11ac. To support that hardware the AREDN code needs (among other things) new drivers. That integration effort is now well underway.

However this new generation of code needs to be tested on all the currently supported equipment. If you have one of the devices listed in [this Google Docs](#) not shown in green and would like to assist in the code testing, please consider sending it to [Tim KN6PLV - his info is good on qrz.com](#). If you do donate one of the listed devices, please put your callsign in the "Contributed by" column, so he doesn't get inundated with multiple identical devices.

Thanks in advance!

DX'ing Jupiter!

One of the reasons that I feel strongly about donating as much of my Amateur Radio material to [Digital Library of Amateur Radio & Communications \(DLARC\)](#) is that there are real gems out there in archival material. As I was preparing my first shipment to DLARC a few weeks ago, I came across this cool article in the [August 1964 issue of Popular Electronics - DX'ing Jupiter!](#) (Page 41).

Signals from outer space? It wasn't known until recently, but the Giant Planet broadcasts signals any ham or SWL can monitor.

ONE EVENING last summer, radio astronomer Dr. Alexander G. Smith of the University of Florida tuned his Japanese pocket BC/SW receiver to 18 megacycles and heard radio signals from the planet Jupiter. He was not surprised; Jupiter's characteristic wide-band, surf-breaking-on-the-beach sound is easy to distinguish from the narrow-band, fading-in sound of a distant phone station or the staccato crash of earth-made static.

Dr. Smith has been studying Jupiter's radiations for nine years. He generally uses Collins receivers and directional beam antennas, but on that particular night an unusually severe noise storm in the atmosphere of the giant planet produced signals strong enough to be readily detected even by a pocket radio with a short whip antenna.

YOU can hear radio signals from Jupiter, too — with nothing more than an ordinary amateur or SWL receiver and a good antenna!

Not only is the subject matter cool - personal [Amateur Radio Astronomy](#), but it's illustrative of how mainstream Amateur Radio used to be - this article was in one of the mainstream electronics hobbyist publications of the era.

We need to get back to that...

ZR > BEACON

- **Hackaday** - [Listen to 64 MHz At Once](#).
-

Feedback Loop

Comments on Zero Retries 0072 - Inovato Quadra and Mastodon query.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

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- Tina Stroh KD7WSF for, well, *everything*!
- Pseudostaffers [Dan Romanchik KB6NU](#) and [Jeff Davis KE9V](#) for continuing to spot, and write about “Zero Retries Interesting” items on his blog that I don’t spot on my own.
- [Amateur Radio Weekly](#) consistently surfaces “Zero Retries Interesting” stories.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing newsletters.

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More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA

2022-11-18

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[1](#)

To answer the inevitable suggestion in advance, Yes, I *could* help be part of the solution to that issue of not much Zero Retries Interesting content on QRZ and eHam. I actually started to do so until it occurred to me that I was essentially doubling my workload by trying to stimulate ZRI conversation on those platforms. In the end, I judged my energies to be better spent in building up Zero Retries.